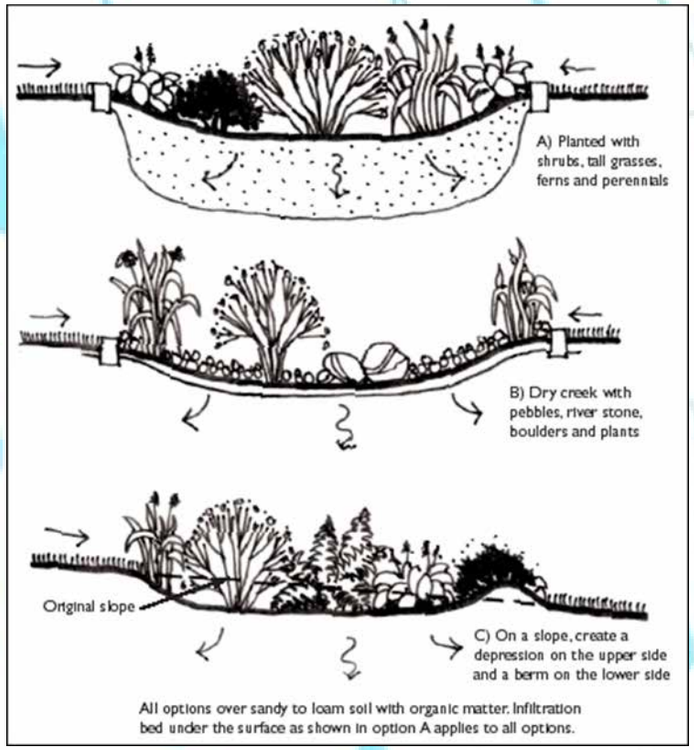
Benefits of a Rain Garden:

- Recharge Groundwater
- Protect Water Quality in lakes, rivers, streams and ground water
- Habitat and Aesthetic Improvement
- Decrease damaging impacts of Stormwater Runoff

A few types of rain gardens: flat site, "dry creek" look, and gently sloped site:



Infiltration Capacity

Rain gardens are generally designed to be drained within four hours after a 1" rain event. So a rain garden is not a pond and does not retain water long enough to support mosquito or other insect breeding cycles. The placement and design must take into consideration the clearance to the seasonal mean high water table. A site that is wet most of the year is not a good site for a rain garden. Other necessary considerations include the permeability of existing soils (a simple percolation test can be useful), utility locations (including septic leach fields) and slope of the site.

Rain Garden & Infiltration "Train"

For further information

There are many websites (three are listed below) with rain garden information and design help.

http://www.lowimpactdevelopment.org/raingarden_design/templates.htm

http://www.tinkerscreekwatershed.org/documents/RGManual.pdf

for bio-retention cell sizing:
http://www.lid-stormwater.net/bio_sizing.htm

All digital photos in this brochure are of LSPA's rain garden.

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LSPA

Devoted to the Environmental Quality of the Lake Sunapee Watershed

A rain garden is a type of bio-retention cell designed to accept, retain (temporarily) and infiltrate rainfall and stormwater runoff. Ideally rain gardens are sited close to the source of the runoff and serve to slow the stormwater as it travels downhill, giving the stormwater more time to infiltrate and less opportunity to gain momentum and erosive power. The retention and increased infiltration also helps to replenish ground-water supplies.

On the surface, a rain garden looks like an attractive garden and it may support habitat for birds and pollinating insects. What makes it a rain garden is in how it gets its water and what happens to that water once it arrives in the garden. Below the surface of the garden, a number of processes are occurring which mimic the hydrologic action of a healthy forest.

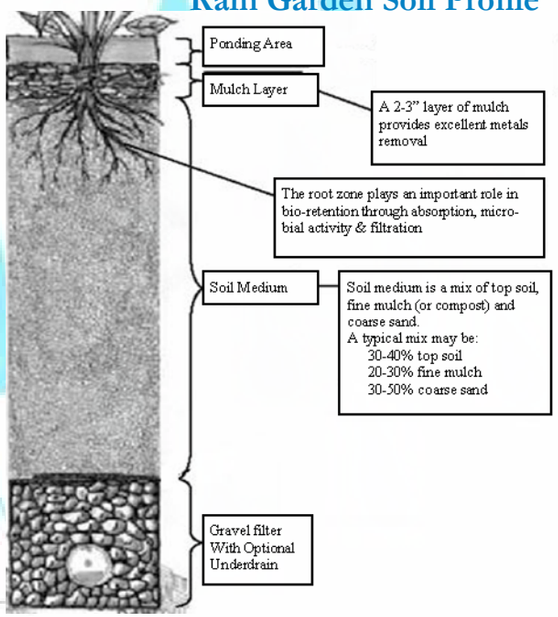
Some rain gardens can receive runoff containing relatively high levels of contaminants, others may receive only rooftop runoff. Contaminants, excess nutrients, and sediment in the stormwater are reduced by the action of the plants and microbes in the growing media (soil mixture). The water is filtered and "treated" and then is slowly released. Multiple rain gardens over an area will have a positive cumulative effect on both the volume and quality of stormwater runoff.

Soil & Plants

Wet to sometimes very dry conditions must be considered in rain garden design and plant selection. Soil mixtures (planting media) are designed for infiltration and are a mixture of loam, sand and shredded mulch (about a 2-2-1 mix). This mixture maintains a relatively high infiltration capability while providing enough organic content and moisture retention to support beneficial soil microbes and plant life. A sandier mix will provide more infiltration. On the surface of the soil mix is a 2"to 3"layer of shredded mulch. This organic layer helps to filter out pollutants and protects the underlying soil mix. The media mix should be to a depth of 18" and ideally 2' or more. The porous planting media mixture should be clean and weed seed free. A 3" to 4" layer of crushed stone underlies the soil mixture and provides further infiltration and storage capacity. An under-drain is an option depending upon soil infiltration capacity.

The plants selected for the bio-retention cell need to be able to withstand both the extremes of flooding and drought. Plants on the upper edges of the garden are often xeric (adapted to dry conditions) with plants lower in the garden being more adapted to floodplain conditions. Plants with deep fibrous roots tend to have a competitive advantage in a rain garden and provide the most cleaning and filtration benefits to the environment. Many riparian edge (adjacent to water) species are particularly well suited to the extreme environments of rain gardens.

Rain Garden Soil Profile



Stormwater Runoff Concerns

With expanding development on the landscape and the increasing frequency and intensity of storm events, stormwater runoff has become a major contributor to water quality degradation. Runoff from lawns, driveways, commercial and residential development, roads, parking lots, and other areas contains a wide array of pollutants such as fertilizers, pesticides, sediment, oil, gasoline, other automotive chemicals, road salt, sand and others. These contaminants end up in surface and groundwater supplies including our drinking water.

Conventional thinking has been to get rid of stormwater as quickly as possible - collect it, pipe it, channel it, ditch it, dump it. This approach combined with the increasing amount of impervious surfaces (surfaces that do not allow water infiltration) such as concrete and asphalt pavements and rooftops, has led to some problems – very high volumes of water moving quickly across the landscape causing silting and lakeside erosion, stream bank and stream bed damage, and less water infiltrating through the soils to replenish our groundwater supplies.

Photos (right) are of LSPA's rain garden.